

# DEPARTMENT OF BIOCHEMISTRY

## GRADUATE PROGRAM GUIDELINES

This document describes the policies of the Department of Biochemistry regarding the granting of the Ph.D. degree. Since these policies are subject to periodic revisions, please keep a copy of this document to establish the rules in effect at the time of your admission to the Department.

### 1. Requirements for the Ph.D. Degree

(a) A passing grade in all of the core and elective courses of the Biological Chemistry Program (BCP) or the Molecular Biology Program (MBP) (see "Requirements for Combined Ph.D. Program in Molecular Biology or Biological Chemistry" for listings). If a grade of less than a B- is earned in a core course, the student is required to retake the course and receive a B- or better. In addition, you must maintain an overall average of B or better.

(b) A passing grade (B- or better) in a total of 1.5 semesters of additional graduate level courses approved by the student's Supervisory Committee. These courses can be a combination of didactic and advanced seminar courses. **However, at least one course MUST be a didactic course.** In some cases a relevant undergraduate course may be approved. For the purposes of this requirement, a half-semester course is defined as up to 2 credits, and a full-semester course is defined  $\geq 2.5$  credits.

(c) Students are required to participate in the following activities throughout their association with the Department:

Biochemistry Department Journal Club (second and fifth year students)

Biochemistry Department Research in Progress

Seminars sponsored by the Biochemistry Department

(d) Passing the Preliminary Exam and thesis defense

(e) Accumulation of at least 14 credit hours of Biochemistry 7970 (Ph.D. Thesis Research)

(f) Writing and submitting a predoctoral fellowship proposal for internal or external funding. Students can write and submit a proposal anytime after officially joining a lab, and must submit at least one proposal during their graduate tenure. Students may apply for internal T32 training grants, the internal Utah Graduate Research Fellowship, external NIH F31 fellowships, the NSF fellowship, or external foundation fellowships (AHA, etc.). International students are typically not eligible for NIH T32 and F31 grants. These students should apply for external foundation grants (like AHA or others) and/or the Utah Graduate Research Fellowship. Copies of fellowship proposals submitted to a funding agency/grant competition should be sent to the Departmental Graduate Program Coordinator to be added to your file.

(g) Registration

(i) Students should register every fall/spring semester as instructed by the Department in order to maintain eligibility for the Graduate School's tuition benefit plan. Students should not register for summer semester, unless they are planning an official action (thesis or prelim

defense). **International students must file a vacation semester form with the graduate school to maintain their visa status during the summer semester.**

(ii) During Fall and Spring Semesters, unless instructed otherwise by the Department, all students must register for Bioc. 7020 (Research in Progress) and the appropriate section of Bioc. 7040 (Lab Research Conferences). Second year students must also register for Bioc. 7010 (Journal Club).

(iii) Students must apply for Utah residency as soon as they are eligible, usually at the end of the second year of graduate work. This is a requirement of the Graduate School's tuition benefit plan and also saves the Department money should we be required to pay your tuition.

(iv) Students considering a leave of absence should discuss in advance with their advisor and the graduate coordinator to insure that their student status is not jeopardized (e.g., if students are not registered for two consecutive semesters, they will lose their insurance eligibility).

(h) Teaching Assistantships and Teaching Duties

The Department funds student stipends in several ways, including research grants, training grants and individual fellowships. In order to preserve equity, all students are required to teach equal amounts, regardless of the source of their individual stipends. The present requirement is 1 full semester (or 2 half-semesters) of assisting. This requirement should be completed by the end of the third academic year (the second year in the Department). Teaching assistant assignments are generally coordinated through the Biology Department, but students may also schedule TAships in graduate courses directly with course instructors.

(i) MD/PhD Students

Departmental requirements for MD/PhD students will be customized for each student (with DoGS approval), but typically waive the 1<sup>st</sup> year MB/BC coursework and TA requirements.

(j) Transfer Students

In unusual circumstances, graduate students may enter the Biochemistry Department without coming directly from one of the Combined Graduate Programs. Such students must be sponsored by a Biochemistry Department Faculty member and must also obtain the approval of a majority of the Core Biochemistry Department Faculty. In cases where the student has not yet taken the required graduate coursework or the Preliminary Exam, it is expected that the student will follow the Biochemistry Department Guidelines. In cases where the student is transferring from another graduate program, the student may petition to get credit for coursework and/or preliminary examinations that were taken elsewhere. These petitions are not granted automatically, however, and must be approved by a majority of the Core Biochemistry Department Faculty.

(k) Academic Misconduct

Issues of academic misconduct are taken very seriously. In order to ensure due process, anyone who suspects academic misconduct by a member of the Biochemistry Department should carefully follow the guidelines for reporting and evaluating academic misconduct. These guidelines are kept on file in the Biochemistry Department Office.

## 2. Supervisory Committee

This Committee administers the preliminary exam, advises the student concerning thesis research and presides over the writing of the thesis. This committee is **your** team and meeting with them through the years should be a positive, productive experience, not an adversarial one. **Students must have selected a 5-member supervisory committee by the beginning of Fall Semester in the second academic year (the first year in the Department).**

You and your thesis advisor should form a Supervisory Committee, consisting of five members with the thesis advisor as the chairperson (Note: as described below, a different committee member will serve as chairperson for your preliminary exam). Three members must have their primary appointments in the Biochemistry Department or be on the list of approved exceptions maintained by the Graduate Program Coordinator (this can include the advisor, but only if he or she has their primary appointment in the Biochemistry Department). At least one committee member must be from outside the Department. An “outside” committee member is defined as anyone whose primary appointment is not in Biochemistry. Faculty members with adjunct appointments in Biochemistry can still serve as outside committee members. Where appropriate, additional faculty members may be added to the committee. You must e-mail a complete list of your confirmed committee members to the Graduate Program Coordinator.

## 3. First Supervisory Committee Meeting

Please read carefully these guidelines for First Supervisory Committee (3) and Preliminary Examination (4), which changed significantly in 2018.

The first supervisory committee meeting, which is not an exam, must take place in the **Fall Semester during the student’s first year in the department (typically 2<sup>nd</sup> year at the U)**. Students must schedule and hold this meeting with their committee prior to the end of the **Fall Semester**. This committee meeting will take on a format similar to future advisory committee meetings (see section 5 below for details/guidelines on this meeting). The purpose of this meeting is to present the background and overall project objectives/goals to your committee, and discuss any preliminary data you have obtained since joining the department. You should see this as an opportunity to get to know your committee, and get early, valuable feedback on the direction of your thesis project. Your advisor will be at this meeting, will serve as chair, and will participate in the discussion, similar to future supervisory committee meetings.

For details on presentation guidelines, meeting length, etc. see section 5.

**Prior to this meeting, students are required to write a one-page specific aims page (single spaced, 11 pt. arial font, 0.5 inch margins) outlining the background, goals and objectives of their project. Students must email this document to their committee 5 days prior to their meeting.**

## 4. Preliminary Examination

The Biochemistry prelim exam is on the student’s thesis topic. Students will prepare a formal written thesis proposal and present/defend their proposal to their thesis committee.

Timing: This exam will take place **during the Spring Semester in the student’s 1st year in the department (typically 2<sup>nd</sup> year at the U)**. The proposal must be prepared by the student, but the thesis

advisor can (and should) assist with its development and refinement (e.g., reviewing draft document, practice talks, discussing relevant background literature). You and your thesis advisor should use the process to discuss and refine your future research plans. **The advisor may not speak at the oral exam unless specifically requested by the committee chair.** Students will typically advance to PhD candidacy after a successful prelim exam. However, in borderline cases this decision may be formally deferred to next committee meeting (which should be held in the fall of the following year in these instances) to allow students time to demonstrate progress/improvement (similar to our current practice).

(a) The preliminary exam will be conducted by your Supervisory Committee. Your thesis advisor will attend, but will not participate in the examination (except as requested by the prelim chair). An examination chairperson should be agreed upon in advance from among the Advisory Committee (in consultation with that person and your thesis advisor). The chairperson's duties include ensuring that you understand the examination procedure, monitoring your progress during the exam period, and producing a final report.

(b) You must choose a **5-week** period **during Spring Semester of your second academic year** in which to prepare and take the preliminary examination. You should try to minimize your other commitments (TA, courses, etc.) during this period. **Failure to schedule your preliminary exam is not an acceptable excuse for delaying your exam beyond the end of Spring Semester.**

(c) Your proposal should also provide a mechanism for getting feedback on your formal scientific writing style. We therefore advise you to discuss your plans with your advisor, write a complete draft of the Research Plan yourself, and then give it to your advisor (and others) with sufficient lead time so that he/she can critique the document and you can complete a rewrite before handing it out.

(d) The proposal should be in the form of an original research grant application and include the sections described below. The format is based on the NIH F31 application, and many descriptions below are taken directly from the NIH fellowship instructions. Page limits are included for each section (single spaced text, 11 point arial font, 0.5 inch margins, and includes all figures and legends, which should be embedded within the text). **These are limits not to be exceeded.** It has been the experience of past committees that quality is NOT proportional to quantity; please be succinct.

**NAME and TITLE (No strict word limit):** Please include your name and title on the front page of the proposal. Also include the summary (below) on this page as well.

**ABSTRACT/SUMMARY (Not to exceed 30 lines of text):** The project summary is a succinct and accurate description of the proposed work and should be able to stand on its own (separate from the proposal). This section should be informative to other persons working in the same or related fields and understandable to a scientifically literate reader. Avoid both descriptions of past accomplishments and the use of the first person. Please be concise. The summary should state the application's broad, long-term objectives and specific aims. Describe the research design and methods for achieving the stated goals. Be sure that the project summary reflects the key focus of the proposed project.

**SPECIFIC AIMS (1 page):** You should provide a list of distinct specific aims that clearly define the goals of your proposal. Each specific aim can be followed by 2-3 sentences of clarification.

**RESEARCH STRATEGY (6 pages total, divided into Significance and Approach sections described below):**

Significance: This section should provide sufficient background information to allow the Committee to understand the planned experiments and their significance (remember that they are not experts in the field). References to pertinent literature must be included. As you prepare and write this section, state clearly the significance of your research in the context of the established facts in the field and the innovation of your approach. You should also include descriptive figures and schemes to aid in understanding the project. You should include any preliminary data you or others have generated in the lab that informs your hypothesis and research plan.

Approach: This section describes in detail the plan for attaining each specific aim, and is usually divided up by aim. For each specific aim, include sections (with subheadings italicized in this sentence) describing the *rationale* for the experiment, description of *experimental procedures* (including methods), *expected outcomes* (including interpretation of the results, conclusions, and future directions), and possible *pitfalls and alternative strategies*. For the purpose of proposing future experiments, you may predict the outcome of proposed experiments, but you should also consider what approach will be taken if plausible alternative outcomes are observed. It is advisable to provide clear figures that help to clarify complex concepts, and it is also often helpful to provide informative “sketches” of expected results (although you should not create simulated data figures that give the impression of presenting authentic data). The prelim document and presentation should not dwell on technical details of standard techniques (e.g., Western blots), but should instead focus on conceptual details like how the experiments will answer an important question, controls, possible outcomes, and how results will be interpreted. Students should be prepared to explain any methods in their proposal at the board. For each proposed experiment, you must state a clear question; the proposed experiment must address that question in a direct fashion; the potential outcome of the experiment must be interpreted in relation to the question; and appropriate controls must be proposed to ensure that the interpretation is valid. If the outcome of the experiment you envision will not resolve the stated question, drop that experiment and propose one that does.

#### **LITERATURE CITED** (no page limit).

(e) You will defend your proposal in an oral examination. At the beginning of the exam, you will be asked to leave the room so that the Committee can discuss the proposal. You will then be asked to give a short (~30 min) formal presentation on your proposal, ideally with ~10 slides, but a strict limit of 30 slides. Your introductory material should be limited to 10 minutes. You should expect questions from the Examination Committee during and after your presentation. They will attempt to discover whether you are able (a) to demonstrate an understanding of the significance of the proposal with respect to the current state of knowledge in the field, (b) to demonstrate an understanding of both the theoretical and practical aspects of the methods and procedures in the proposal, and (c) to defend the rationale of the experimental designs and approaches.

Although the thrust of the questioning will usually focus on the proposal, inquiries of a more general nature can also be expected. You should therefore be prepared to answer questions concerning material covered in the First Year Curriculum Core Courses. A detailed recall of the material is not required but a firm familiarity with general principles is expected. **You are therefore strongly encouraged to review the material covered in the First Year Courses prior to the examination.**

The oral portion of the examination typically lasts for about 2 hours. When the examination is completed, you will once again leave the room so that your performance can be evaluated. A critical

evaluation of the examination will then be given. A passing performance requires the approval of 3 of the 4 members of the Examination Committee. Students not performing to the satisfaction of the Committee on the written and/or oral part of the exam will either be failed outright or asked to address the deficiencies in any manner and schedule agreed upon by the Committee. If a student fails to pass the exam, he or she may be terminated from the Ph.D. program.

(f) The following timeline for preliminary exams must be followed unless an exception is granted by the chairperson of your Examination Committee. **It is your responsibility to see that this schedule is observed. Failure to respond in a timely fashion will be considered inadequate academic progress and may be grounds for dismissal from the graduate program.** Remember that the **entire** examination, from declaration to oral exam, must occur within a 5-week period and that the exam must be **completed** during the **Spring Semester**.

### **Preliminary Exam Timeline:**

**Day 1:** Student declares to the prelim committee chair, their thesis advisor, and the Department Office that they have started their prelim after scheduling a mutually agreeable defense date.

**Day 30 (or earlier):** Student hands proposal out to committee at least 5 days before the oral defense.

**Day 35 (or earlier):** Student defends proposal.

(g) You should choose a 5-week period during the spring semester that will be relatively unencumbered in consultation with your advisor.

(ii) The exam period begins when you declare your intention to begin the exam and obtain the agreement of the Examination Committee chairperson. You should not cease work in the laboratory on the pretense of beginning preliminary exams until you have formally declared your intent to **both** your thesis advisor and Examination Committee chairperson.

(iii) The oral exam must occur within 5 weeks of the initial declaration. Do not declare the start of the exam until you have confirmed an oral defense meeting time with the committee. Please be aware of the potential for conflicts in scheduling a meeting of 5 faculty members; **do not wait until the last minute to attempt to schedule the exam.**

(iv) The proposal document is intended to educate your Supervisory Committee on your project and also to provide them with the opportunity to give you feedback on your plans. **It is therefore essential that you distribute the document at least 5 days before your Supervisory Committee meeting.** It is your responsibility to find a time that is suitable, schedule a room for the examination (typically an EEJMRB conference room), and to deliver a pdf of the proposal to the Committee members. When making these arrangements, don't forget your thesis advisor, who must be present at the examination.

(v) Following confirmation from the thesis advisor that the student has successfully passed the preliminary examination, the Graduate Program Coordinator will submit the Report of Qualifying Exam for approval by the committee.

(h) Please prepare well and take this process seriously. The format is intended to provide everyone with a chance to assess your progress, help shape your future thesis research, and provide you with formal feedback on your writing and oral presentation skills. Acceptable prelim exam performance is

required to continue in the Ph.D. program. You may be required to rewrite the document if it is deemed inadequate. In cases where very little scientific progress has been made or other major problems are evident, the Supervisory Committee can recommend that the student pursue a Masters rather than Ph.D. degree.

(i) Upon satisfactory completion of the preliminary examination, you are formally a candidate for the Ph.D. degree in the Biochemistry Graduate Program

#### 5. Annual Advisory Committee Meetings

New students in the Department will have their first committee meeting during the **first Fall Semester** that they are in the Department (see section 3 above). Their prelim exam will take place in the **Spring** semester of their first year in the Department (see section 4 above). **After completing the prelim exam, students are required to meet with their committee at least once each academic year before the end of Spring Semester until graduation.**

**Students should prepare a presentation of no more than 30 minutes (w/o interruption) for these meetings.** Generally, committee meetings should be scheduled for 1.5 hours. **Five days prior to the meeting, students will send their thesis committee a 1-2-page summary of their thesis progress.**

You will be asked to leave the room briefly at the start and end of each committee meeting for a private discussion among committee members. At least four of the five committee members must be present (physically or virtually) at each thesis meeting. If a committee meeting has not been held by the end of Spring Semester in a given academic year (or fall semester of the first year in the Department), the Biochemistry office will be directed to submit a grade of "incomplete" for all research courses. Failure to schedule a meeting in a timely fashion may result in more drastic measures, including withholding of stipends. More frequent meetings may be held if desired by the student and/or the Committee. **The student is responsible for scheduling these meetings, and for reporting their completion to the Department Office.** Following each year's meeting, you must submit a completed "Annual Supervisory Committee Verification" form to the Department Office.

#### 6. Time Limits

(a) Starting in the student's fifth year in graduate school, the student and his/her Supervisory Committee must establish a tentative written timetable for completion of the thesis during their annual meetings.

(b) As required by the Graduate School, a time limit for full completion of the Ph.D. program is set. After seven full years in the program (since the first matriculation), the student is no longer permitted to continue in the Ph.D. program. Short extensions (usually no more than one semester each) can be recommended by the Graduate Committee for approval by the Dean of the Graduate School. Special cases involving leaves of absence and transfer students will be dealt with by the Graduate Committee.

#### 7. Program of Study

Students must inform the Graduate Program Coordinator of their anticipated defense semester as soon as it has been determined by the supervisory committee. The Graduate Program Coordinator will then submit the Program of Study for approval by the committee.

8. Thesis Writing and Defense

(a) The thesis must conform to the university rules governing such matters, and the Supervisory Committee will have discretion on other matters concerning content and form within the university limits. There is a university Thesis Editor, and a publication from that office is available to assist the student.

(b) The Supervisory Committee and student will determine when the student should begin writing the thesis. The thesis must be presented to each member of the Supervisory Committee at least 1 week prior to the date of the oral defense.

(c) After the thesis is written, the student will give a one-hour seminar on the thesis research, at a location and time convenient for attendance by the Supervisory Committee and general community. After the seminar, the Supervisory Committee and student will meet for the "Report of the Final Examination," the results of which are forwarded to the Graduate Committee, and subsequently to the Department Chair and the Graduate School office.

(d) The university requires that "the candidate must be regularly enrolled for three or more credit hours during the semester in which the final oral examination is taken."

9. Compensation

(a) The Department is committed to paying a stipend to each student, plus health insurance and full coverage of tuition expenses as long as the student is in good standing and has the sponsorship of a thesis advisor within the Department. The stipend is \$28,560 for the 2019-20 academic year.

(b) The student is expected to devote full effort toward graduate studies while enrolled in the program. It is not permissible for a student to work at another job nor to be enrolled in another educational program. A variety of student loans are available to ameliorate cases of financial hardship. If a student wishes to gain professional experience outside the department, for example, in teaching, explicit permission must be obtained from the thesis advisor and the department chair, with the understanding that the primary role of the departmental program is research training.

(c) The Department's parental leave policy is posted on the departmental webpage.

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